MIT
Department of Mathematics
& The Theory of
Computation Group
At CSAIL

Bioinformatics Seminar

Speaker: Roderick V. Jensen, Brann Professor of Physics, Biology and Mathematics, University of Massachusetts Boston

Title: Shotgun Microarrays: High-throughput Validation of Gene Expression Changes Using Multiple Platforms

Date: Monday, 26 September 2005

Time & Location:

Refreshments: 11 am in the Theory of Computation Lab at MIT's Building 32, Stata Center Room G-575

Talk: 11:30 am the Theory of Computation Lab at MIT's Building 32, Stata Center, Room G-575

URL: http://www-math.mit.edu/compbiosem/

Abstract:

DNA Microarrays have emerged as important tools for the large-scale measurement of differential gene expression in a wide variety of biomedical experiments - comparing normal and diseased tissues, different states of biological processes, and the response to drugs or toxins. The current generation of whole genome, oligonucleotide microarrays provide detailed quantitative information on the levels of expression of tens of thousands of genes. However, as with any laboratory measurement, this data is subject to errors. To identify real changes in gene expression it is essential to understand and model the sources of errors in these measurements. To this end our laboratory has participated in extensive studies of microarray data from multiple commercial microarray platforms including the GE/Amersham/Motorola CodeLink bioarrays, the Agilent in situ microarrays, the popular Affymetrix GeneChips, as well as the newer Illumina, Combimatrix, and ABI arrays. The comparison of differential gene expression measurements both within and across platforms provides a statistical basis for dealing with the problems of both false positives and false negatives. Our "shotgun microarray" approach has successfully identified and validated gene expression signatures in a variety of different applications ranging from the study of patterns of gene expression in primate brain development to the diagnosis and prognosis of neurologic diseases.